

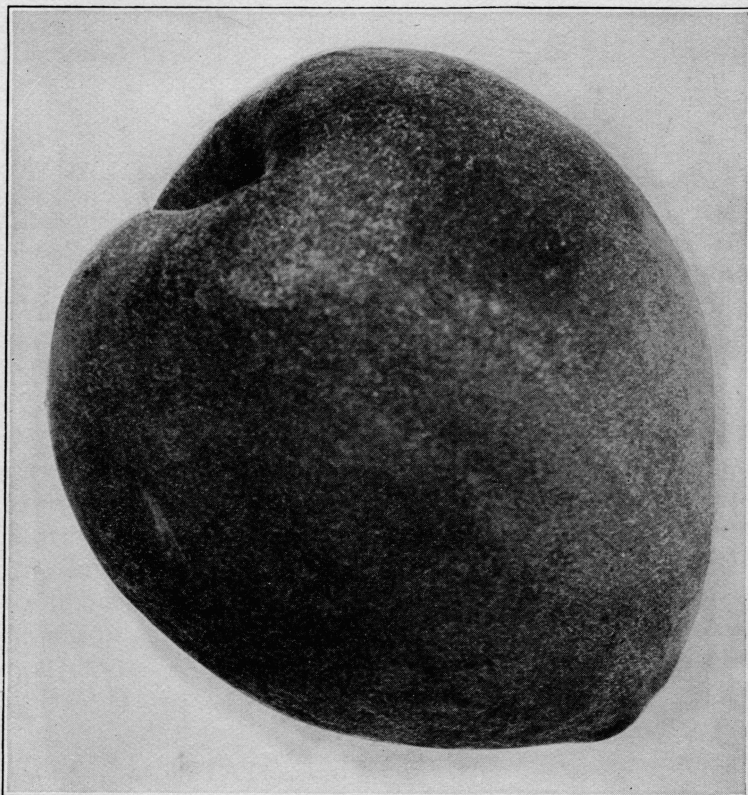
# TEXAS AGRICULTURAL EXPERIMENT STATIONS.

## BULLETIN 80

Horticultural Section, December, 1905.

### PEACH GROWING IN TEXAS.

BY E. J. KYLE.



THE TEXAS ELBERTA.

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## PEACH GROWING IN TEXAS.

E. J. KYLE.

### INTRODUCTION.

Peach growing in Texas has reached a very important and interesting stage. During the winters from 1900 to 1904, it is estimated by several of our most prominent nurserymen and fruit growers that from two to two and a half million trees were planted annually. The indications are that there will not be over 250,000 trees set this coming year. We may well ask what has brought about this sudden check to the most important horticultural industry in our state. A short history of the development of the peach business will be interesting at this point, as it will show the principal reasons for the present condition of commercial orcharding in this state.

In 1891, peaches began to be shipped from Jacksonville in car load lots, and it was soon clearly demonstrated that commercial peach growing could be made a success over a large section of East Texas. The majority of the growers at that time had only a small acreage in orchards and as a rule gave them fairly good care and attention. The trees did not bear a full crop every fruit season, but during a good year very large profits were often made on a surprisingly small acreage. The reports of these large profits were widely circulated by the papers of the state then beginning to preach diversification. Peach growing and the profits to be gotten therefrom were discussed on the streets and at every public meeting of the people. Many of the reports were exaggerated, and the impression became general that about all that was necessary to make a fortune in peach growing was to plant out an orchard and wait a few years until the trees began to bear, very little consideration or thought being given to the necessary care and management of the orchard in the meantime.

This was the general condition of affairs when the drop in the price of cotton, followed in a few years by the advent of the boll weevil, drove thousands of farmers into the fruit business. The fever affected the town people and a large majority of the merchants, lawyers, doctors, etc., planted out orchards, placed tenants in charge and began to wait for the few years that must pass before the trees would bear crops of fruit. That time has now come, but instead of the trees producing profitable crops of fruit, many of them are already dead, others are badly diseased, and it will only be a matter of a few years until the majority of these orchards will have to be abandoned. It is hot too much to say that ninety per cent. of the growers had no previous experience in orcharding, and at least that per cent. of the orchards were grossly neglected. It is therefore not surprising that the majority of these orchards are absolute failures, and many of the growers are disappointed in the present results and distrustful of the future.

It will not pay to cultivate and take care of an orchard, even if it is only half done, for ten or twelve years for only one or two crops of fruit. And yet that is just what ninety-five per cent. of the Texas growers are doing. Our orchards should be made to bear uniformly each season. It is the crop in the off-year that brings the most money. Whenever an orchard fails to produce fruit every year there is always some good cause. There are two general reasons for the fail-



FIG. 1. ORCHARD LAND NOT PROPERLY PREPARED BEFORE TREES WERE SET.



ure of the peach crop in this state. First, trees going into a dormant condition early in the season are apt to have their fruit buds either forced out during a wet open fall, or destroyed by a sudden mid-winter freeze preceded by a week or ten days of warm weather. Second, trees often fail to set a crop of fruit buds as a result of scanty growth which comes from general neglect of the orchard.

The object of this bulletin is to lay before the practical grower the fundamental principles of successful peach culture in this state, the proper observance of which will enable him at least to partially overcome these frequent failures of the peach crop and to better withstand the increased competition.

It may be well to state in the beginning that the general tendency is for the fruit grower to plant out too large an acreage. There is no doubt but that better results can be gotten by reducing the acreage. There are few growers who should attempt to plant more trees than they can look after themselves; having a renter or tenant to care for an orchard generally results in failure and disappointment. If the grower is not willing to keep an orchard in good condition, he had much better keep out of the business. There is no tree that will respond as quickly to good treatment as the peach, and few that will show lack of cultivation sooner.

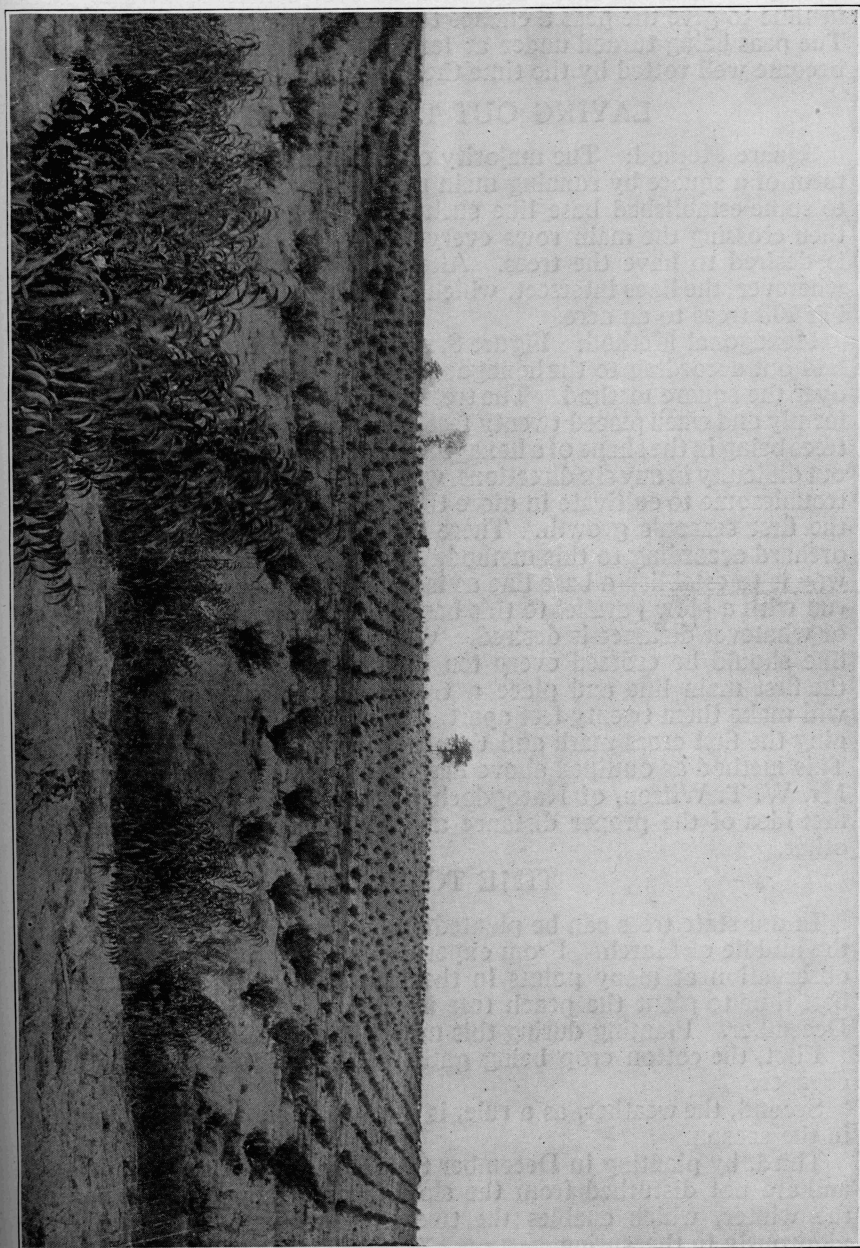
## PREPARATION OF THE LAND.

The first serious mistake that is generally made in this state, in planting an orchard, is in the preparation, or rather lack of preparation, of the soil. The great majority of our growers seem to have gone to the extreme in the attempt to get their orchards started as cheaply as possible. Too great a saving at first often proves to be false economy before the orchard is many years old. Before any planting takes place the soil should be thoroughly and deeply broken and well pulverized. It is often advisable if the top soil is shallow to turn up a small amount of sub soil. This early deep plowing allows the roots of the young trees to strike well down in the soil so that they will not suffer so much from later plowings or drouths.

When forest land is used for an orchard, a strong effort should be made to free the soil of all stumps or small brush growth before planting the trees. It is very difficult to clean land after being set to orchard, and the expense of cultivation is considerably greater on account of having to use the bull-tongue or sweep, or some such implement instead of the disc and spike-tooth harrow. Some of the largest orchards in the state have to be cultivated with a turning plow on account of being so full of stumps and sprouts. Figure 1, is a fair sample of many of the young orchards in the state, while some orchards containing hundreds of acres are in a much worse condition. Figure 2, is a view taken on the Morrill farm during the latter part of June, 1904. The woods or forest growth was removed from this land during the fall of 1903. When this picture was taken not a sprout or stump of the old forest growth could be seen.

When an orchard is planted on old land, or that upon which crops have been grown for a number of years, the soil is generally depleted of its humus and plant food. A good treatment of such land is to begin the year before the trees are set by planting Irish potatoes to

FIG. 2. PEACH ORCHARD SEVEN MONTHS AFTER FOREST WAS REMOVED.



be taken off during the latter part of May, and then follow with a crop of cow peas which should be turned under to a depth of at least six inches in the early fall. In case it is not desirable to plant potatoes, any quick maturing crop will do that will come off the ground in time to give the peas a chance to make a good growth before frost. The peas being turned under at least by the first of November, will become well rotted by the time the trees are planted.

### LAYING OUT THE ORCHARD.

**Square Method:** The majority of our orchards are laid out in the form of a square by running main rows with the bull-tongue parallel to some established base line such as a fence or edge of woods, and then crossing the main rows every twenty feet or whatever distance is desired to have the trees. After this has been done trees are set wherever the lines intersect, which is generally every twenty feet, giving 108 trees to an acre.

**Hexagonal Method:** Figure 3, shows the plate of an acre of trees laid out according to the hexagonal form. This has several advantages over the square method. The trees cover the ground much more uniformly and when placed twenty feet apart gives 126 to the acre. The trees being in the shape of a hexagon, cultivation can be carried on without difficulty in any six directions, while with the square form it is rather troublesome to cultivate in more than two directions, especially after the first season's growth. There are several ways of laying out an orchard according to this method. The simplest and most economical way is to establish a base line as is done in the square form and then run with a plow parallel to this base line, rows every 17 feet 4 inches, or whatever distance is desired. When this has been done the main line should be crossed every ten feet. You should then go along the first main line and place a tree at every other crossing which will make them twenty feet apart. The second row is gotten by skipping the first cross-mark and then putting a tree at every other one. This method as outlined above has been practiced for many years by Mr. W. T. Wilson, of Nacogdoches, from whom the writer got his first idea of the proper distance at which the rows should cross each other.

### TIME TO PLANT.

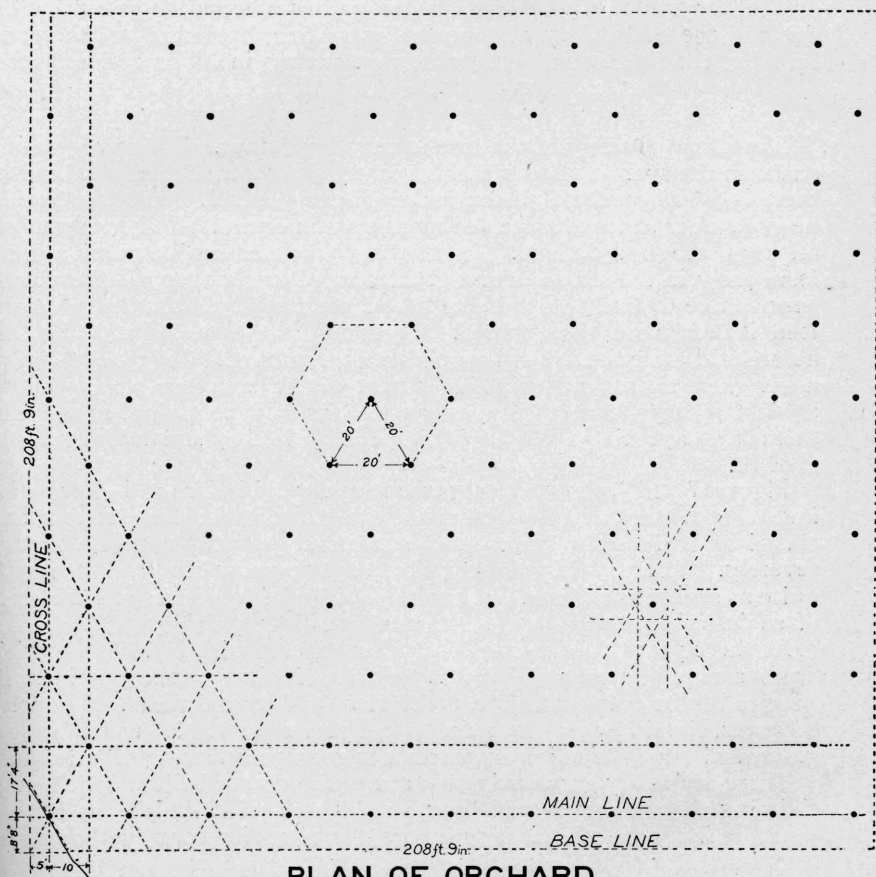
In our state trees can be planted from the first of November until the middle of March. From experience on the Station grounds and observation at many points in the fruit belt, I am satisfied that the best time to plant the peach tree in Texas is during the month of December. Planting during this month has the following advantages:

First, the cotton crop being gathered, labor is more plentiful and cheaper.

Second, the weather, as a rule, is more suitable for work than later in the season.

Third, by planting in December the roots get well settled in the soil and are not disturbed from the slow growth they make throughout the winter, which enables the tree to start much earlier and more vigorously in the spring.





**PLAN OF ORCHARD**  
**126 TREES TO THE ACRE.**  
**FIG. 3.**

## PRUNING BEFORE PLANTING.

Roots:—Figure 4, shows the normal method followed by a majority of the largest and most successful growers in the country. Cutting off all the roots is by far too severe a shock to the young tree and will not give as good results even in a wet region—the only place where it should ever be tried—as the normal method.

Top:—The above illustration shows the proper distance to cut the tops off the young trees. When the tree is set the stem should extend from eighteen to twenty inches above the ground. This close cutting back causes the tree to branch low and if kept properly headed it will allow most of the fruit to be gathered from the ground without the use of ladders, and at the same time facilitate pruning and thinning the fruit which will be a great saving in labor and expense.

## FUTURE PRUNING OF THE TREES.

The future pruning of the tree is very important. When vegetation starts in the spring, shoots will begin to grow on the stem wherever there is a bud on the eighteen inches above ground. The tree should be gone over at least twice during the summer and all shoots rubbed off that are not desired. In this way the tree can be given a good form early in the season and a great deal of surplus growth prevented. From three to five branches should be left ranging from ten to eighteen inches from the ground. Figures 5 and 6, show a young tree before and after the lower branches were removed. It is well to leave a few extra shoots until the latter part of the summer so as to guard against injury from cultivation as well as from the wind, as some of them are apt to be blown off, especially if they are making rapid growth.

Figures 7 and 8, show a young tree one year old before and after pruning. From one-third to one-half of the growth should be cut back at this time, while some of our most successful growers prune even more severely. The pruning when the tree is two years old should not be quite so severe as at first, but the top should be well cut back and it is often desirable to remove at least one-third of the year's growth.

At three years old the tree should be well set with fruit buds which are borne on one year old wood. From this time on the pruning will not need to be quite as severe as the first and second years. The tree, however, should be pruned some every year so as to give room for new growth without which it is impossible to get a good setting of fruit buds.

There are many growers in this state who do not believe in pruning, claiming that the trees will bear just as well without it. It is true that the first crop of fruit is as heavy if not heavier from the unpruned tree, but after that the results are never so good as when the tree is pruned every year.

## CULTIVATION.

Thorough cultivation of the orchard is undoubtedly the most important factor in the successful growing of peaches in Texas. It is true that a crop of fruit can be gotten now and then without much attention being given to cultivation, but the failures are many and the business becomes one of mere chance with the favors largely against the grower. The fruit crop that brings the most money is the one that is

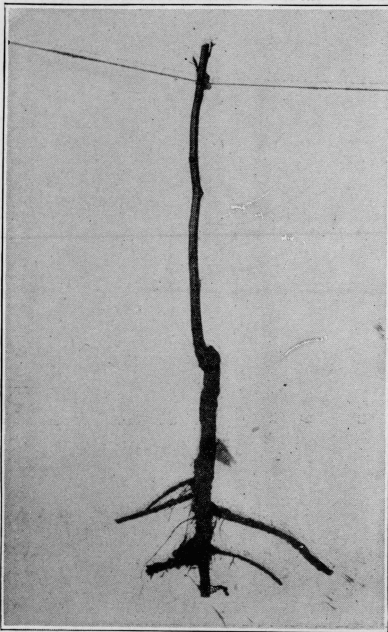


FIG. 4. TREE PROPERLY PRUNED.



FIG. 5. BEFORE PRUNING IN SUMMER.



FIG. 6. AFTER SUMMER PRUNING.



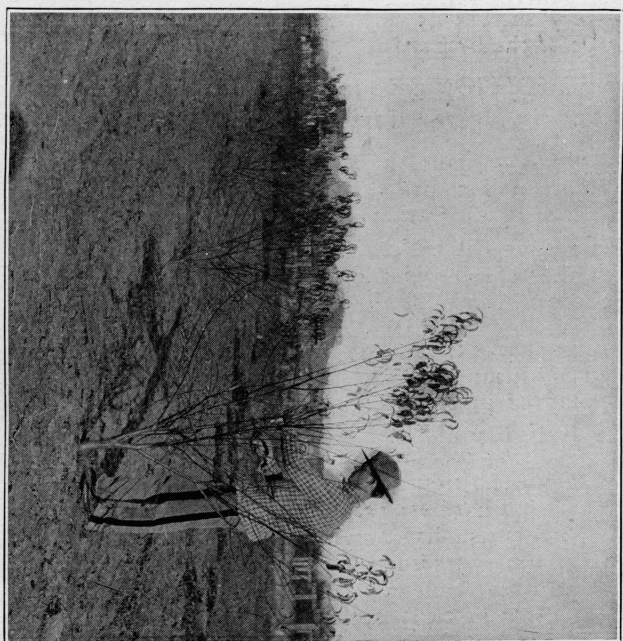


FIG. 7. BEFORE PRUNING AT ONE YEAR OLD.

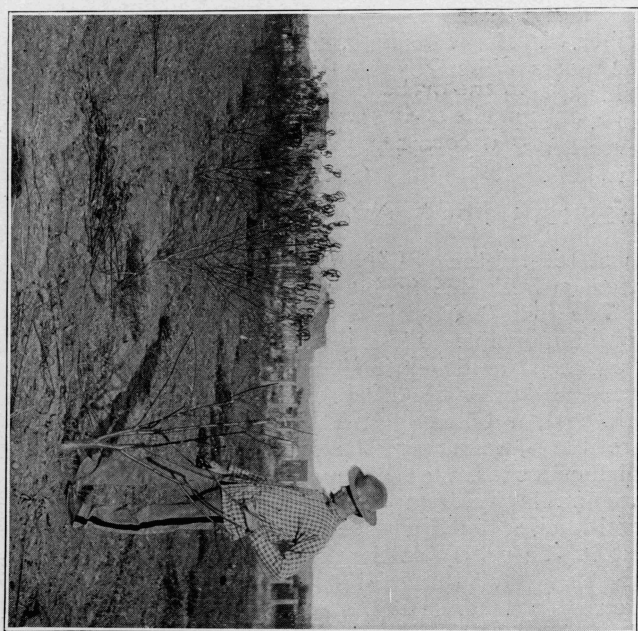


FIG. 8. AFTER PRUNING AT ONE YEAR OLD.

borne during an off-year, and such crops can only be gotten by preparing the trees to withstand some adverse condition, which is the cause of the majority of the failures. The largest and most successful fruit growers in every section of the country are those who believe and practice tillage of the orchard.

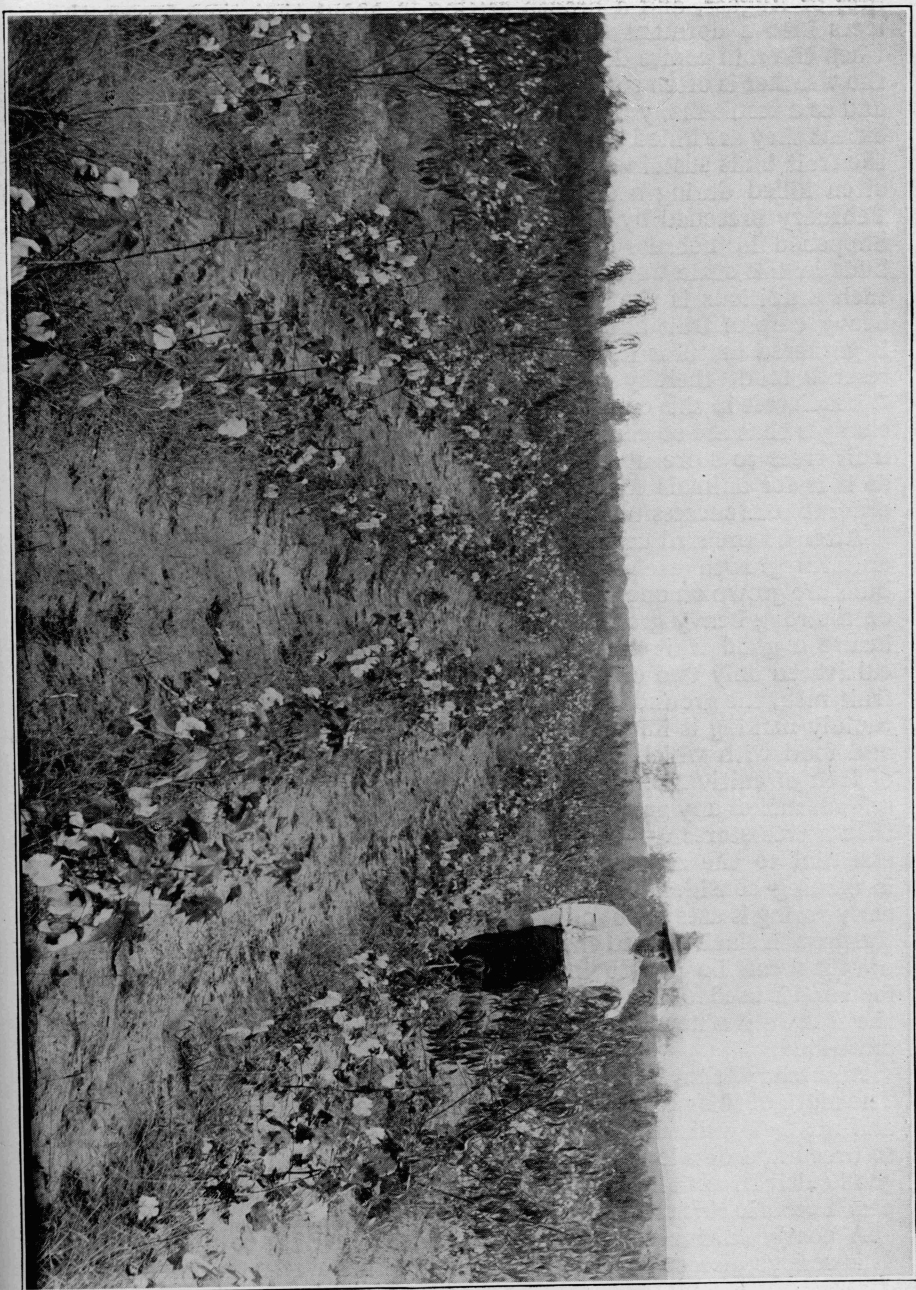
## PRESENT CONDITION OF THE COMMERCIAL ORCHARDS IN THIS STATE.

It is a well known fact that a large per cent. of the orchards throughout the fruit belt are very poorly cultivated. This neglected condition is clearly seen from a distance but becomes plainly evident as one walks among the trees and gives them a close inspection. A large part of these orchards will never bear one good crop of fruit, and few of them will pay for the little time and labor spent on them. The common method of cultivating the majority of these orchards is well calculated to leave them, especially after the first season's growth, in a neglected condition. The first spring after the trees are set cotton is generally planted in the orchard, not only between the trees but often in the fruit row itself. The orchard is cultivated whenever it is thought necessary to work the cotton and both crops are generally laid by at least by the first of August. Figure 9, is a view of a two year old orchard that has been treated in this way. The second spring the same rotation is usually carried out except that the cotton is not as a rule, planted in the tree row. From the third summer on the trees are generally given clean cultivation, that is the soil is broken with a turning plow in early spring, after which, about all the work it gets is to be run over once or twice with a disc harrow or broken again about the middle of the summer with a plow. Figure 10, is a view taken of a three year old 80-acre Elberta orchard on the 19th of September, 1905. Cotton was planted in this orchard the first two summers while it was given clean cultivation the present season. This season the orchard had received two cultivations with a turning plow, once in the early spring and again during August. This orchard nevertheless is considered far above the average in the heart of the fruit belt.

## EVIL EFFECTS FROM NOT PROPERLY CULTIVATING.

The almost total failure of the fruit crop every few years in this state is often entirely due to the gross neglect of the tillage of the orchards. The evil effects, in fact, from this lack of cultivation are many and important. First, the trees very often become dormant and ripen up their wood before the summer is over thereby subjecting them to the danger of either having the fruit buds forced out during the late fall or killed by a sudden freeze during winter. Second, the trees are able to make very little growth while maturing a full crop of fruit which cuts short the fruit buds for the following year. Third, the trees are unable to store up sufficient reserve food, and therefore, go into winter in a weakened condition. Fourth, the borer becomes a serious pest in the poorly cultivated orchard. Fifth, lack of cultivation allows the water to stand in places which is favorable to the work of the root rot. These evil effects are so serious they will bear further discussion.

FIG. 9. COTTON PLANTED IN TWO YEAR OLD ORCHARD.



It is a very common thing during the month of November to see peach trees in bloom throughout the fruit belt. The reason for this is that the orchards are not cultivated after the middle of July or first of August, and a drouth setting in about that time forces the trees into a dormant condition before the summer is over. Then when the rain comes during the latter part of September or October, the weather is often so warm the trees make a start as in early spring, and as a result many buds actually open while others swell to such an extent they are killed by the first freeze of winter. Besides the injury the fruit buds sustain during the fall, a large percentage of them are often killed during a sudden freeze in the months of January and February preceded by a week or ten days of warm weather, such as happened in February, 1903, when over 90 per cent. of the fruit buds in this state were killed. The tree that suffers the most under such conditions is the one that has exhausted itself in producing a heavy crop of fruit and not receiving any cultivation after the fruit is gathered matures its wood prematurely and fails to store up any reserve food, thereby going into the winter in a weak condition. A peach tree in this condition falls an easy prey to the sudden climatic changes that are so common to our state. It is just as necessary for fruit trees to store up reserve food in the form of sugar and starch as it is for animals to store up food in the form of fat or tallow in order to pass successfully through a severe winter.

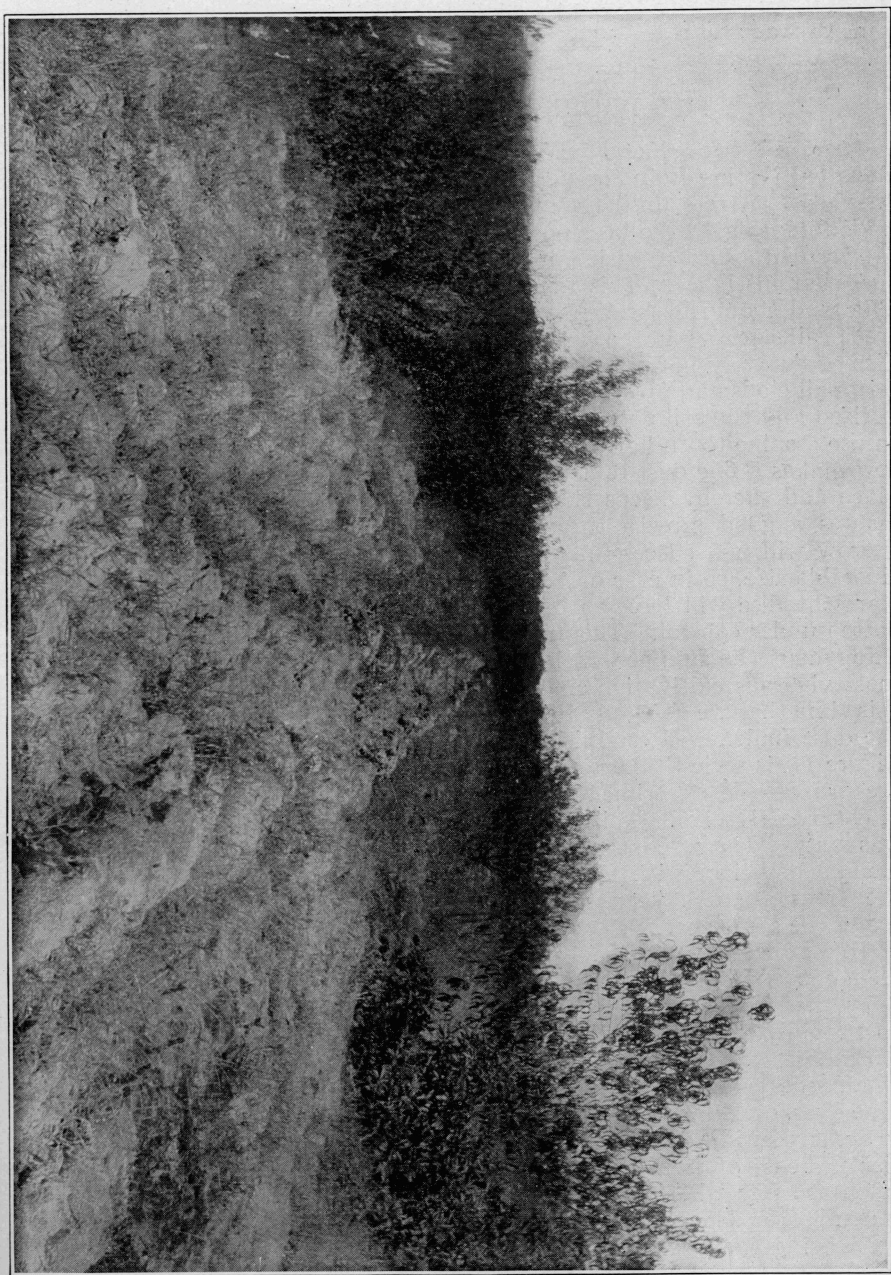
After an orchard comes into bearing it is very hard to get a good uniform growth each year without vigorous cultivation. As fruit buds are grown on one year old wood it is necessary for the tree to put on a strong heavy growth during the spring and summer in order to insure a good fruit crop the following year. When an orchard is cultivated only two or three times, as is the rule with a great many fruit men, the ground becomes hard and weedy and loses its moisture rapidly making it impossible for the trees to secure enough moisture and food with which to develop fruit and wood buds. As a result of lack of cultivation, especially after the fruit is gathered, the tree seldom makes any growth after the middle of July. The reserve food that a tree stores up during the spring and summer months is very essential to the success of the following fruit crop. When a tree is making considerable growth and developing its fruit during the early spring it uses about all the food it is able to take in; but as soon as the growth slackens and the fruit is taken off there is more food taken up than can be put to immediate use. This is known as reserve food and is used for the purpose of forcing out the blossoms and running the tree until a new lot of foliage is developed for the manufacture of more food.

An orchard that is poorly cultivated is nearly always full of borers. The moth of this pest finds a safe hiding place in the weeds and grasses and not being disturbed by cultivation is given a good opportunity to breed and develop as it chooses. When the soil is kept clean by good cultivation little is to be feared from this, one of the most serious peach pests in this state.

A poorly cultivated orchard is especially inviting to the root rot. This serious disease is caused by a fungus that works on the roots of the peach, as well as other fruit trees. There is some loss from this disease even on land that is given the best care and attention, but it is



FIG. 10. VIEW IN 80 ACRE ORCHARD IN WHICH COTTON WAS GROWN FIRST TWO SEASONS.



in the orchard that is poorly cultivated and where the water is allowed to stand that the disease is found in its worse form. The roots of the peach soon sour in the warm over-moist soil, and it is at this point that the disease takes hold and works such havoc with the trees. This dreaded disease seldom does serious damage on soil that is well cultivated, and therefore, well drained.

### THE PROPER CULTIVATION.

There are two general methods of caring for an orchard: one is clean cultivation from the very first, and the other is to plant crops between the trees until they begin to bear. Clean cultivation will undoubtedly give the best results and should be used whenever the grower can afford to wait two or three years before he gets any returns for his labor. This method should be carried out as follows: The land should be broken with a turning plow just as soon as the tree begins growth in the spring. As soon as this has been done the disc or cutaway harrow should be run over the land so as to break down all clods and pulverize the soil. After the clods have been pulverized and the soil gotten in good condition, all that is necessary is to use a spike tooth harrow every ten days or two weeks. This harrow makes a fine dust mulch which prevents evaporation from taking place and thereby keeps the trees well supplied with moisture and insures a good growth throughout the summer. The spike tooth harrow will not successfully destroy weeds after they get of considerable size, so in case of a wet spell during which the weeds get a start the disc will have to be resorted to until the land has been gotten under control. This method of cultivation should be kept up throughout the summer, at least until the first of September. The most vigorous cultivation should be done during August, for it is at this time that we generally have a drouth and it is necessary to keep the dust mulch well established in order to keep the trees growing. Figure 11, is a view taken on the 28th of September, 1905, of a peach orchard on the experiment grounds at College, showing the effects of clean cultivation. This orchard at the time the picture was taken was only twenty months old. Compare the trees as to size and amount of foliage with those in Figures 9 and 10. In Figure 10, the trees are one year older than these, while in Figure 9, the trees are of the same age.

To a grower who has never tried it, this method of cultivation may seem too expensive for practical purposes, but a little figuring will show that it costs only a small amount per acre. It is surprising how rapidly one can get over orchard land either with a disc or spike-tooth harrow. A man is doing a good day's work to get over two and a half acres with a turning plow, while with a disc eight acres can be gone over, or ten with a spike-tooth harrow. With these implements an orchard can be cultivated from twelve to fifteen times during the summer at a cost of from three to four dollars per acre, which is not too much to pay when we consider that the success or failure of an orchard often depends upon the amount of cultivation it gets.

Cropping the Orchard.--It is often the case that the grower does not feel that he is able to give his orchard good cultivation for two or three years without getting any returns from the land. It may then become advisable to plant out crops between the young trees



FIG. 11. EFFECTS OF CLEAN CULTIVATION ON TREES TWENTY MONTHS OLD.

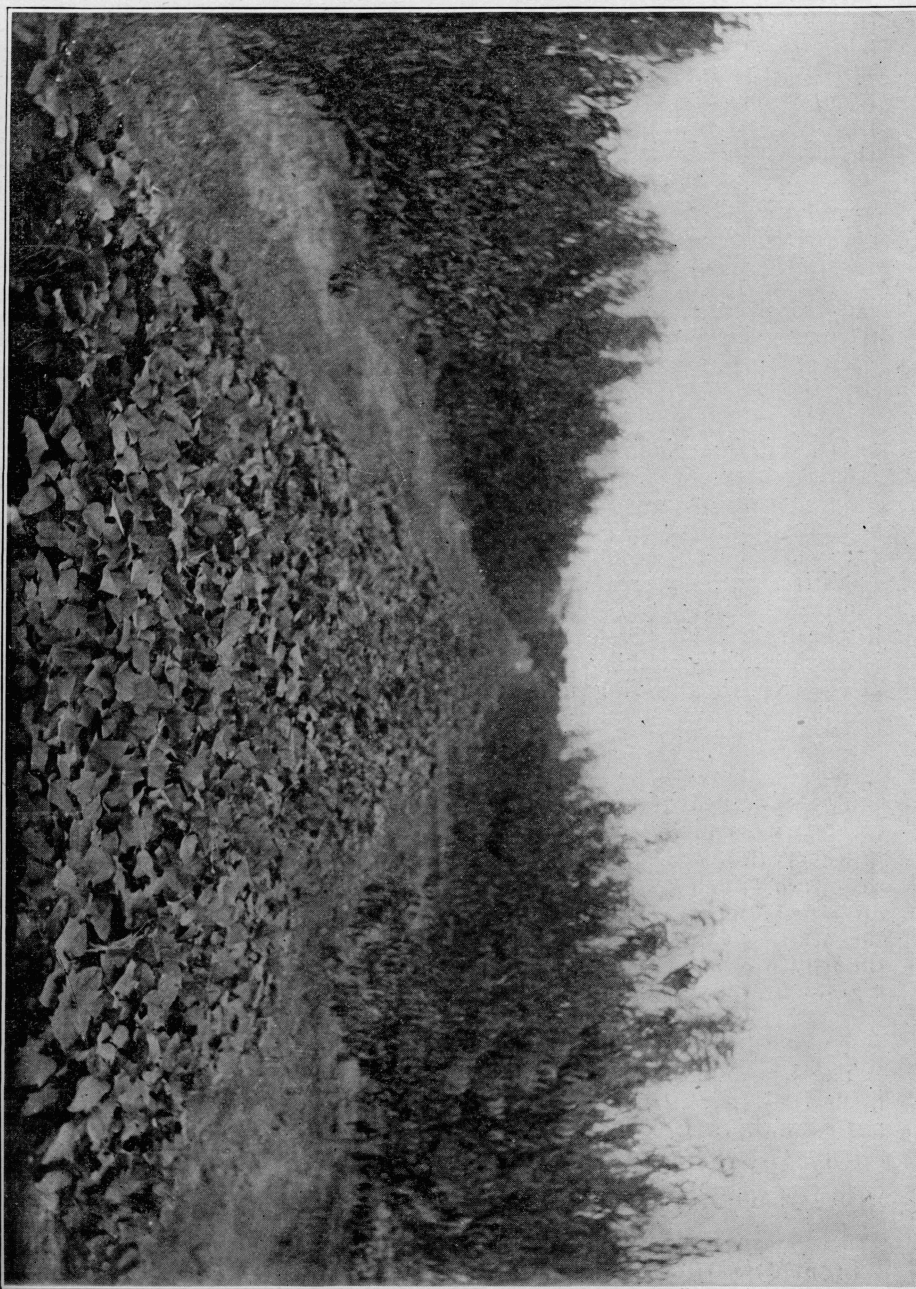
during the first two or three summers. By this method the trees receive cultivation while the crop is being worked. It can safely be stated that any crop will interfere with the growth of a tree to a certain extent, but there are some crops that do much more harm than others. As to the effect upon the orchard, much depends upon the kind of crop and the space allowed the tree. Corn or some rank growing crop should never be planted between peach trees. A crop of this nature makes such a rapid, vigorous growth the young trees are robbed of both food and moisture and are sure to be stunted. Cotton is a crop that is most generally planted in the orchards of this state. A serious mistake is often made in planting the cotton in the tree row and also in getting it too near the trees. Whenever this crop is used the rows should be far enough from the trees to allow of cultivation even after the cotton is laid by. There should never be more than four rows between two tree rows, and three would be much safer. The orchard is sure to suffer if the cultivation of the trees stops when the cotton is laid by. The space on each side of the trees should be kept thoroughly stirred at least until the first of September.

Experiments carried on at this Station for the past two years go to show that by far the best results from cropping are gotten by using the following rotation. Plant an early maturing crop that will come off the land about the first of June, then follow with cow peas, peanuts, sweet potatoes, or some crop that will mature late in the summer. Figure 12, shows a young orchard in which the following crops have been planted. The trees were set the first of February, 1904. Irish potatoes were planted the 20th of the same month and taken off the 25th of May. Ten days afterwards sweet potatoes were planted and taken off in October, 1904. In the spring of 1905, early vegetables were planted and taken off the first of June. Sweet potatoes were again planted and are now being harvested as this bulletin goes to press, December 1st, 1905. The potatoes and early vegetables were fertilized but the sweet potatoes were grown without any extra application. The soil was gotten in thorough condition for all plantings, and in the case of the first crop in the spring cultivation was kept up until about a week before the crop was moved. After the first crop was taken off, the soil was thoroughly broken and pulverized and the sweet potatoes planted and cultivated between the rows as long as the vines would permit. The soil on each side of the trees was kept stirred until the first of September. Four rows of the first three crops were planted between two peach rows, while only two of the last were planted. Figure 12, shows the growth which these trees made in two seasons during which time four crops were taken from the land. These trees are not yet two years old but are heavily loaded with fruit buds and give promise of a good crop this coming season.

The advantage of planting such crops as Irish potatoes, tomatoes, etc., is that the soil is well fertilized having more plant food added than is removed by the crop. Then again these crops come off early so that the soil can be gotten in fine condition before the second crop is put on. By this method the soil is kept stirred throughout the summer and the trees are kept going until September.



FIG. 12. TREES PLANTED FEB. '04. VIEW TAKEN SEPT. '05. DURING WHICH TIME FOUR CROPS HAD BEEN



## THE BEARING ORCHARD.

After the trees have begun to bear under no circumstances should the orchard be cropped. The trees need all the food and moisture they can possibly get in order to mature the fruit properly. In a bearing orchard cultivation should never begin until the growth starts in the spring. Earlier cultivation than this is apt to force out buds so that they may be seriously injured in case of a late spring frost. After cultivation has once begun it should be thorough. Use the disc until the orchard is free from weeds and the soil is well pulverized, then bring in the spike-tooth harrow which should be used on the orchard every ten days or two weeks, and as soon as possible after every rain.

In the management of an orchard there is nothing that will pay as well as thorough, systematic cultivation used with common sense and judgment. Allowing the peach orchard to stand in the sod as is recommended by some people in this state, is calculated to do immeasurable harm to those growers who take the advice.

### THINNING THE FRUIT

One of the principles most essential to successful fruit growing is the proper thinning of the fruit. In spite of this fact, however, only a small percentage of the fruit growers thin their fruit, but among this small number will be found those who have made the greatest success. The object of thinning is to give the fruit its three greatest qualities, size, flavor and color. The size is greatly augmented by the increased supply of food material; the flavor is highly improved by the fruit having an early and abundant supply of food. The color is heightened by making the heaviest thinnings from the shady part of the tree, thus leaving a larger percentage of fruit exposed to the sun light than when the tree is left un-thinned.

### TIME OF THINNING.

There is no definite time to thin. It is one of those questions that must be determined largely by circumstances. It is generally believed, however, that the thinning should not be done earlier than the June drop, nor later than the hardening of the seed. Some growers are governed only by size of fruit, thinning as soon as the fruit reaches the size of a small marble or hickory nut. It is a good idea to thin the fruit just as soon as all danger of frost is over. Figure 13, shows a good size at which to thin.

### DISTANCE OF THINNING.

The best distance at which to thin the fruit is from six to eight inches. When the fruit is used for drying purposes the distance need not be more than four or five inches. Figure 14, shows the result of thinning fruit to six inches.

### EFFECT OF THINNING ON THE ANNUAL BEARING OF THE TREE.

From data already given we can see the failures in the fruit crop are very common here in this state. There is every reason to believe that the proper thinning of the fruit when the trees are overloaded will help greatly to decrease the number of these failures. When trees put



FIG. 13. PROPER SIZE AT WHICH TO THIN.

forth all their energies and use up all available plant food in producing an enormous crop of fruit, it is unreasonable to expect them to produce a full crop of fruit buds before the following year. There is also little doubt but that thinning the fruit and thereby preventing the trees from over bearing will considerably lengthen the life of the orchard.

### METHOD OF THINNING.

The fruit is picked off with the hand and dropped on the ground. It is often convenient to hold the limb, especially if small, with the left hand and pick the fruit off with the right.

### ORCHARD PESTS.

The Crown Gall:—Figure 15, shows one of the most serious and wide spread peach pests in the state. This disease is now to be found on peach roots in most every section of the state where this fruit is grown. The disease has not been under study very many years and as yet there is considerable difference of opinion as to its nature. It is a fungus growth which causes knots or a warty growth to form, principally on the main roots near the crown of the tree, but it also attacks the crown itself at the surface of the ground and is sometimes found at some distance on the lateral roots. The disease is very contagious, being easily communicated by mere contact of a diseased with a healthy tree, and also by galls being broken off and scattered throughout the orchard by means of the plow and harrow. There is no complete remedy as yet discovered for this pest. When a grower receives his trees from the nurseryman he should carefully examine them and if there are any indications of the gall the tree should not be planted. When diseased trees are found in the orchard the soil should be pulled back with a hoe from the top roots and a mixture of one part of copperas, two parts of copper sulphate and three parts of lime should be applied in the form of a paste. This remedy was used with good success by Prof. Toumey, of Arizona, who has carried out extensive experiments in the hopes of finding some complete remedy for the disease.

Borers:—The borer is one of the oldest and most common enemies of the peach. There have been many remedies for this pest but few of them have given anything like general satisfaction. The old method of cutting the larva out with a knife, used by most of the practical growers of the country, seems to still give the best results. The trees should be gone over during May or June in the spring, and October in the fall, and wherever the exuding gum shows the presence of the borer he should be cut out and destroyed. The following formula recommended by some of the East Texas growers gives promise of considerable value: Seven gallons of Beaumont oil to one pint of carbolic acid thoroughly mixed and applied with a paint brush near the crown of the tree. The mixture should not be applied over a foot from the ground as it is apt to severely injure the tree when the application is made on the branches or even high upon the trunk. Care should also be taken not to make too heavy an application.

The best preventive, however, against the borer is to keep up thorough cultivation of the orchard. There are practically no borers in the trees on the Station grounds that have received clean cultivation as recommended in the first part of this bulletin.



FIG. 14. PROPER DISTANCE TO THIN.



Root Rot:—This disease is doing considerable damage to the fruit trees in this state and as yet very little seems to be known about it. It can be easily recognized as it makes a white coating beneath the bark. Wherever cotton or other crops die, peaches planted upon the same spot are very apt to be destroyed by this disease. Wet soils are also favorable to its spread. The principal way to guard against this disease is therefore to plant your trees on well-drained soil which is free from alkali spots and give the trees good cultivation.

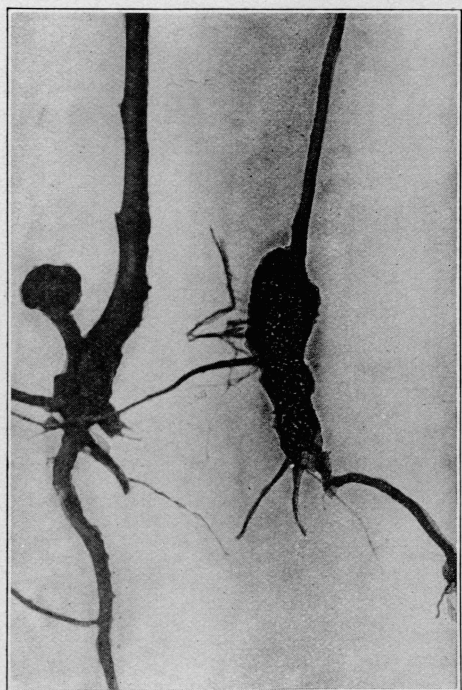


FIG. 15. CROWN GALL.